Second United Nations International UN-SPIDER Bonn Workshop: “Disaster Management and Space Technology - Bridging the Gap”

UN-Campus, Bonn, Germany, 13 -15 October 2008

Meeting Notes

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I. INTRODUCTION AND BACKGROUND:

The Second United Nations International UN-SPIDER Bonn Workshop: "Disaster Management and Space Technology - Bridging the Gap" was organised by the United Nations Office for Outer Space Affairs (UNOOSA) through its UN-SPIDER Programme (United Nations Platform for Space-based Information for Disaster Management and Emergency Response) together with the German Aerospace Center (DLR) and with the support from the International Strategy for Disaster Reduction – Platform for the Promotion of Early Warning (ISDR/PPEW) and the United Nations University – Institute for Environment and Human Security (UNU-EHS). One of the main goals was to promote the access and use of space-based technologies and solutions for disaster management and emergency response within relevant communities.

In its resolution 61/110 of 14 December 2006 the United Nations General Assembly established the "United Nations Platform for Space-based Information for Disaster Management and Emergency Response – UN-SPIDER", as a programme of the United Nations Office for Outer Space Affairs, to provide universal access to all countries and all relevant international and regional organizations to all types of space-based information and services relevant to disaster management. UN-SPIDER supports the full disaster management cycle by being a gateway to space information for disaster management support, serving as a bridge to connect the disaster management and space communities, and being a facilitator of capacity-building and institutional strengthening, in particular for developing countries.

As part of the UN-SPIDER outreach activities, several workshops have been organized in 2008 to raise awareness within the user community of the benefits of using space-based information and solutions, to assess its needs and to contribute to specific activities of the programme. Specifically, this second international workshop in Bonn provided an opportunity to bring together decision-makers and experts from both the space technology and disaster management communities, international scientific organizations, knowledge transfer and educational institutions, as well as internationally active private companies, with the intention of sharing their best practices and to bring their knowledge, products and technologies for risk and disaster management, humanitarian aid and emergency response.

The first workshop held in Bonn, which was organized jointly with DLR and with the support of the Government of Germany, brought together 90 participants from 39 countries.

More information on the outcome of the first international workshop and the presentations made during the workshop are available at http://www.unspider.org.

II. ATTENDANCE:

A total of 120 participants from the following 38 countries attended the Workshop: Austria, Bangladesh, Belgium, Brazil, Cameroon, Canada, China, Colombia, Eritrea, France, Germany, Guatemala, India, Indonesia, Iran (Islamic Republic of), Ireland, Italy, Japan, Republic of Korea, Kyrgyzstan, Namibia, Nepal, Netherlands, Nigeria, Panama, Portugal, South Africa, Spain, Sri Lanka, Sudan, Switzerland, Thailand, Turkey, Ukraine, United Arab Emirates, United Kingdom of Great Britain and Northern Ireland and, United States of America.

The Workshop was also attended by representatives of the United Nations Office for Outer Space Affairs of the Secretariat and other UN organisations including the Office for the Coordination of Humanitarian Affairs (UNOCHA), the United Nations University (UNU/EHS), the International Strategy for Disaster Reduction (UNISDR/PPEW), the United Nations Convention to Combat Desertification (UNCCD), the United Nations Development Programme (UNDP), the United Nations High Commissioner for Refugees (UNHCR), , the United Nations Water Decade Programme on Capacity Building (UNW-DPC), the World Health Organisation (WHO), the World Food Programme (WFP) and, the IOC-UNESCO.

The workshop also included representatives from the United States Agency for International Development **(**USAID**)**, the Geneva-based GEO Secretariat and the Joint Research Center (JRC) of the European Commission, ESA as well as from national space agencies of China, Germany, Iran, Spain, South Africa, USA and Ukraine.

Numerous supporting organisations were represented as following: Remote Sensing Technology Center of Japan (RESTEC), ITHACA, Center for Satellite-based Crisis Information (ZKI), SERTIT, THW / UNDAC Germany, International Institute for Geo-Information Science and Earth Observation (ITC), Institut for Applied Remote Sensing, (EURAC Research), Global Runoff Data Centre (GRDC), Namibian Department of Water Affairs, Kyrgyz Geodesy and Geoinformatics Department, Pan American Institute of Geography, History and the Sudanese National Center for Research, and the universities from Bonn, Cologne, Koblenz-Landau, Salzburg, Pavia, Tsukuba and Buea. Representatives from the following German ministries attended: Federal Ministry of Economics and Technology, Federal Ministry of Defense, Federal Ministry of Transport, and Federal Foreign Office.

Additionally, national disaster management organisations from China, India, Nigeria, Thailand, and Turkey participated next to NGO’s such as the Asian Disaster Reduction Center (ADPC), CATHALAC/SERVIR, LIRNEasia, COOPI, CartONG, and PREDECAN.

Another marking feature of the workshop was the high interest of the human health community, expressed by the participation of the Centre for Research on the Epidemiology of Disasters (CRED), the German Institute for Disaster Medicine (EMDM), the Charité-University Medicine, the Institute for Hygiene and Public Health (Bonn), the Institute for Aerospace Medicine (Cologne), the Public Health Agency of Canada, the Nepalese Department of Health Services, and the Health and Climate Foundation.

Finally, the workshop also attracted participants from private companies such as ESRI, InfoTerra, GeoEye, Logica, ARUP, WhereGroup, and Avanti Communications.

Funds allocated by the Federal Government of Germany and DLR were used to defray the costs of the workshop including side-events and air travel and daily subsistence allowance of 15 participants and 1 representative of the Office for Outer Space Affairs.

III. PLENARY PRESENTATIONS:

The presentation sessions provided participants with the opportunity to learn how space-based information and solutions could be used in disaster management and humanitarian relief work, with accounts of existing and planned projects highlighting the need for a coordinating entity at the global level. The presentation sessions were meant to stimulate the discussions within the working groups.

Details of the programme of the Workshop, the background materials and the presentations made are available on the website of the UN-SPIDER programme (http://www.unspider.org).

The workshop programme is included as Annex I.

IV. THEMATIC SESSIONS:

On of the main goals of this workshop was to link both the space community and the disaster management community, and to provide results in terms of a way forward regarding the setup of an integrative information and communication platform. In order to reach this goal the workshop was divided into four thematic sessions as following:

1. Space technology in support of risk and disaster management

Moderator: Robert BACKHAUS (UN-SPIDER)

Background

The first session illustrated relevant space-based solutions and information for risk and disaster management support and emergency response including on-going and planned initiatives, case studies and best practices, available geospatial data for disaster studies and capacity building opportunities. It also underlined the role of GEO with respect to the SBA "Disaster". Additionally, the prototype of the UN-SPIDER Knowledge Portal (communication and information platform) was presented.

Key questions and topics discussed:

- Further identification of existing and planned Communities of Practice that contribute to bringing together the space-based technology and disaster management communities
- Intensified harmonisation of the various existing initiatives that are contributing to helping developing countries access and use space-based technologies for disaster management and risk reduction

- Design and functionality of the UN-SPIDER Knowledge Portal to ensure that relevant information is easily accessible and disseminated to all interested end-users

Recommendations and Perspectives

- The Regional Support Offices (RSO) will have a key function in identifying and building regional Communities of Practice. This applies to the information on regional priorities and best practices as well as to ensuring regional and local lines of communication (the "last mile" issue).
- The activities of the RSO will have to be supported by the UN-SPIDER Knowledge Portal as an information and communication platform. On-line capacity however is mandatory for its use.
- The scope of the UN-SPIDER Knowledge Portal is defined by the intertsect of space technology application and disaster management. "Neighbouring" initiatives and portals will neither be duplicated nor ignored, but complemented.
- Further development and implementation of the Knowledge Portal prototype is to be guided by a sustained feedback process to ensure optimum architecture, functionality and content. Respective information material will be provided to a voluntary iteration core group recruited during the Workshop. This process will also be open to further participation e.g. of regional Communities of Practice.

2. Vulnerability and Risk Assessment

Moderators: Joern BIRKMANN & Juan Carlos VILLAGRAN DE LEON (UNU/EHS)

Background

Remote sensing is increasingly been used for rapid damage assessment, hazard mapping and also for vulnerability and risk assessment. The second session dealed with the challenges of vulnerability and risk assessment at present and in the future with regard to hazard of natural origin and climate change – combining remote sensing and ground truth data. The session also dealed with the issue regarding how space-based data is incorporated into information platforms for disaster preparedness and response. In this context practitioners and scientists have been invited to discuss current approaches, particularly with regard to the question on how to combine assessment components based on data from census and other surveys with data generated through remote sensing.

Further, the session explored opportunities to assess vulnerability and risk before and after disasters and case studies regarding how such assessments find their ways into information platforms such as SERVIR. Emphasis was given to the comparison regarding the use of remote sensing information for vulnerability and risk assessments with respect to sudden-onset and to creeping hazards at different scales. Furthermore, the session presented current work in different world regions, such as the assessment of tsunami vulnerability in Egypt and Indonesia and the assessment of flood vulnerability in Vietnam and Germany. Special attention was given to sudden-onset hazards on the one hand and creeping as well as future hazards (e.g. sea-level rise) on the other. In addition, the session focused on examples of information platforms which have been setup to present such vulnerability and risk information in the scope of disaster preparedness and response.

The plenary group was split into three groups targeting 3 topics:

a - Vulnerability
b - Hazard & risk
c - Information platforms for disaster preparedness and response

Each working group tackled the following three issues:

1.) Examples regarding how space-based data is used in each case (for vulnerability, hazard & risk, it would focus on identification and assessment; while for early warning and disaster risk response it would focus more in the use of information to improve management capacities)

2.) Lesson learnt: what has worked, what not

3.) The way forward: ideas on a potential web-based platform where to share examples and lessons learn.

The session finished with a plenary session where all groups presented their discussions, highlighting both the lessons learn and the way forward.

Key questions and topics discussed:

- How is the vulnerability and risk assessments structured and conducted?
- Which elements at risk can be assessed with remote sensing information?
- How to assess exposure and fragility based on remote sensing?
- What are major components that have to be addressed using census data or survey data?
- How to integrate remote sensing information and census data within one assessment approach?
- How should information platforms devote to disaster preparedness and response incorporate information regarding vulnerability and risk?

What are future research needs in this area?

Recommendations and perspectives from breakout groups

Group A: Vulnerability

Moderation: Joern Birkmann
Rapporteur: Niklas Gebert

Recommendations for UN-SPIDER

- Linking remote sensing with participatory approaches: Local stakeholders shall contribute to vulnerability related data input, e.g. participatory GIS and data collection (contributions from different authorities in a country), case studies and derived manuals to be collected by the platform and published on the UN-SPIDER website for distribution.

- Development of methodologies which go beyond remote sensing: e.g. using remote sensing in combination with statistical data.

- UN-SPIDER also shall channel information, products in more traditional ways so that specific user needs can access what UN-SPIDER provides.

- Development of a synthesis report on the potentials and limitations of remote sensing with a strong link to user needs.

- Enlarge the charter of UN-SPIDER by not only focusing on products related to disaster response challenges but also on products that serve disaster risk reduction. Therefore, e.g. also the monitoring of creeping processes of environmental and global change in the context of climate
- change is necessary.

- Challenges in the arena of vulnerability assessment are to link the various disciplines of vulnerability research. Therefore, UN-SPIDER shall act as a platform to make the different approaches from various disciplines transparent to the academic world and practitioners.

- UN-SPIDER shall facilitate the validation of vulnerability assessments; they need to be assessed by looking at vulnerability outcomes after a disaster.

- UN-SPIDER shall facilitate the development of simplified terminologies and methods for end-users of vulnerability information, thereby focusing on products needed for specific disaster risk reductions strategies.

Group B: Hazard and risk

Moderation: Peter Zeil
Rapporteur: Ebru Alarslan

Recommendations for UN-SPIDER

Results from this working group were summarised by a mindmanager map (fig.1). The group differentiated between the following four aspects:

- Prerequisites
- Examples
- Lessons learned
- The way forward

Regarding prerequisites a couple of crucial elements have been identified among them terminology, to differ between multi-hazard / single-hazard, primary / secondary hazard and natural / man made hazard. Further topics are scaling issues, target audience, scope, and time. To the term risk a differentiation between elements of risks was delivered regarding assets such as infrastructure, population or species. Regarding mapping activities it was distinguished between maps describing and assessing an already existing

phenomenon or event and mapping the probability of something that may happen, i.e. prevention mapping.

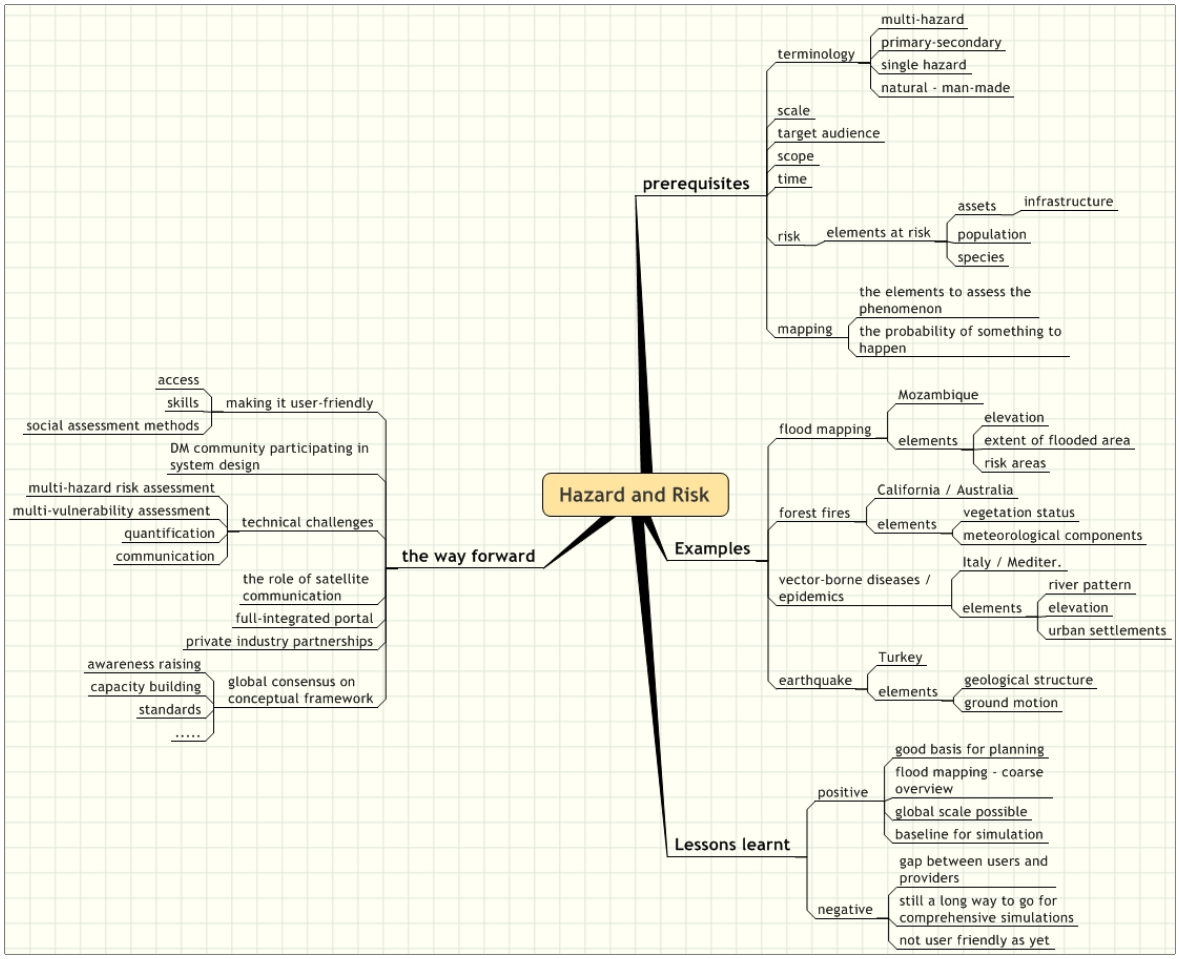

Figure 1: Results from working group B: Hazard and risk

Several examples were quoted that show the variety of hazard and risk phenomena such as floods, forest fires, earthquakes, and vector-borne diseases and epidemics.

In view of lessons learnt the group reflected on positive experiences reporting that space-based information provide a good basis for planning and simulation from local to global scale. Negative experiences demonstrate that there is still a gap between users and providers, comprehensive and thus adequate simulations are not yet available for the full spectrum, and finally, the handling of applications and tools is not always very user-friendly.

Finally, the way forward discussion picked up the topic of making applications more user friendly, especially in terms of access, skills, and including social assessment methods such as participatory approach etc. The latter is directly related to the proposal that the disaster management community should participate in developing the design of multi-hazard oriented systems for risk and vulnerability assessment and early warning.

More general thoughts were exchanged concerning the increasing importance of satellite communication technology, fully integrated portal solutions, and public private partnerships. Global consensus on the conceptual framework was identified as one important goal including awareness raising, capacity development and institutional strengthening, and the establishment of internationally accepted standards.

Group C: Information platforms for disaster preparedness and response

Moderation: Juan Carlos de Villagran
Rapporteur: Sandra Sudhoff / Stefan Voigt

General discussion points:

- What is the aim?
  - Its about knowledge (!) – not data oriented
- Who are the target user groups?
  - Disaster Managers to Disaster Managers,
  - Providers to Providers, and
  - Across the communities, however will not serve the all operational needs of the end user community – more focus on decision makers and managers
- Use cases?
  - Serve different business cases in the domain of disaster management
- UN-SPIDER is not only about response – it is about all phases of disasters – a main focus is even on the knowledge and preparedness phase
- All possible information should be there – even if, due to limited bandwidth, it can not always be accessed by everyone
- Who should have access to the portal?
  - Practitioners, relief workers, decision makers (to what level? How many organisations per country?)
  - Provider community organisations
- Maps/Imagery might be sensitive, thus it might be interesting to channel information through national portals or regional portals
- Special reference to information on specific affected countries, should be attached to data on the portal, to stay objective and transparent
- There is an issue with the information / data being spread out between different institutions and authorities – how to connect those? Can UN-SPIDER help?
- Disaster management authorities have frameworks of cooperation regionally (e.g. Asian Disaster Reduction Centre) - Space Agencies also have a tradition to cooperate – the interface and linkage between these domains is the difficult thing (technical and knowledge gaps) – UN-SPIDER may help here

Role and operation of Regional Support Offices

- Help to bridge the gaps to national focal points (user side) as well as to existing local and regional networks/capacities
- Some times the RSO facilitate the strengthening of GIS/RS capabilities at the emergency management authorities (national or regional)
- RSO may help to sort out regional/national information requirements / issues / sensitivity / data share policy at national level

- Country profiles are important tools to tackle the regional/national information requirements (10 country profiles, submitted by the respective states are already available for main portal, at different level of detail)
- Help to customize the UN-SPIDER information to regional needs and collect national/regional information and requirements
- Provide fora for discussion of the different elements of the UN-SPIDER platform/portal and meta information to existing data
- Interaction of central portal and regional fora is under development (currently testing phase of 6 months for the regional fora)
- RSOs can support training and awareness building as well as interconnectivity of actors in the region

Further Suggestions to the for the portal

- Checklists for operation
- Training and e-learning in different languages
- Customised user profiles may be helpful to structure the usage of a complex portal
- Suggestion to not just connect what ever is out there, but structure the portal on a top down basis at this stage of the project
- There are many other initiatives (example for the Americas) – those should be approached
  - We should go from national to regional / supranational initiatives
- Operational Coordination
  - Virtual OSOCC for relief workers existing on Relief web
  - Virtual OSOCC for Space Assets / Providers could be implemented via UN-SPIDER and should serve the Reliefweb/VOSOCC

3. Contribution of space-based technologies to existing and proposed Early Warning Systems

Moderator: Douglas PATTIE (UNISDR-PPEW)

Background

The development and usability of early warning systems contributes to the socio-economic development by reducing the impact of hazards and increasing the resilience of its people and structures. This session examined how public-private partnerships (PPP) centered on space-based technologies can enable the development, establishment and embedding of early warning systems. The speakers and participants highlighted efforts to gather, analyze and evaluate the demand for EWS and how PPP could propose and initiate projects and provide solutions.

Key questions and topics discussed:

- How do space-based technologies play a connection role between donors and recipients, between national and international organizations?

- Are space-based technologies transforming the growing involvement of the private sector into sustainable public partnerships that could initiate projects and provide solutions?
- What appropriate and efficient instruments communicate with the demand side (typically governments in need of EW systems) so that the demand language is received by the private supply sector without distortion?
- Do the UN systems establish the right interfaces to address the public and private sector on national and international level to promote and place the demand side in a form and language which is understood from the public and private sectors?

Recommendations and Perspectives

The session focused on the experiences of a number of multinational companies and NGOs dealing with space-based data and highlighted the possible linkages between disaster risk reduction, technology, data dissemination and public-private partnerships (PPP). As the flagship UN document for disaster reduction, the Hyogo Framework for Action (2005) in its priority action 4 "Reduce the underlying risk factors" is requesting the promotion and establishment of public–private partnerships in order to better engage the private sector in disaster risk reduction activities. Along with the UN Global Compact it encourages the private sector to foster a culture of disaster prevention, putting greater emphasis on, and allocating resources to disaster preparedness activities such as risk assessments and early warning systems.

This partnership perspective was noted by InfoTerra which has focused on their core business, space data provision, from which opportunities and partnerships that contribute to both profit and the planet are a key feature. The Global Runoff Data Centre (GRDC), Koblenz, Germany continues to play a role as a facilitator between data providers and data users. GDRC immediate goals in partnership building include:

- Approaching participating countries to inform on status and request additional metadata, time series data and access to near realtime data;
- Re-approaching not participating countries to reconsider their position and to participate in future projects;
- Finalising river discharge station selection together with participating countries;
- Adopting real-time data collection software; and
- Investigating funding options together with related programmes.

The Sri Lanka-based NGO, LIRNEasia, provided an effective last mile solution within its proposed national warning system. In this type of advocacy and awareness raising partnership, the private sector partners (ICT–oriented companies) work with other stakeholders to take a leadership role in broadly disseminating information and training opportunities on the various type of hazard information in the warning chain. WorldSpace satellite radios can play a significant role given proper funding and implement ation strategies that incorporate appropriate training and the participation of communities.

Recommendations from the National Disaster Reduction Center of China noted that international and domestic cooperation is essential for disaster reduction and should be expanded in greater scope and depth.

Actively developing case studies for capacity building from the aspects of cooperation mechanism, scientific research and technical improvement is greatly needed. For the Ukraine Space Research Institute data integration

for natural disaster monitoring requires a partnership that can deliver freely accessible, available and standardized data. Lack of in-situ measurements, especially for developing countries remains an important issue where the need is for more than a portal. A distributed information infrastructure is desirable where specific methods for data fusion and data assimilation should be developed.

In social investment and philanthropy partnerships, the private sector provides financial support, contribute volunteers or expertise, or make in-kind contributions, including product donations. Regarding these types of partnership ESRI, a global GIS developer, noted that the lack of standard data sets across state and county boundaries were a problem following the Katrina hurricane in the USA. In the Katrina disaster there was no central capability to integrate dynamic data for a single view of damage, status, situational awareness. It was noted that certain applications for GIS developed in one area would not work in another area with different data. As a result, ESRI now builds partnerships based on fusing all types of physical and temporal geo databases into fusion centers.

Overall, this session explored how successful reduction of disaster risks requires the involvement and sustained commitment of both public and private parties. Multi-stakeholder national institutes, companies and other forums can encourage dialogue and develop common interests. When common threats from natural hazards and mutual benefits of reducing risks are well understood, private-public community partnerships with space-based industries can emerge as a tool for disaster reduction.

4. Disaster Medicine, Telemedicine and Integrated Vector Management (IVM)

Moderator: David ROGERS (Health and Climate Foundation)

Background

The fourth session explored the contribution of space-based solutions in the field of Emergency / Disaster Medicine, Telemedicine and vector-borne diseases. New strategies for prevention and control of the latter are emphasizing "Integrated Vector Management" as an approach that reinforces the linkages between health and environment, optimizing benefits to both.

Especially in developing countries the vulnerability to climate and environmental changes is likely to increase as demands on resources continue to rise in association with rapidly growing populations. Additionally, there is a growing awareness of increasing risks to human health. Epidemics of weather- and climate sensitive infectious diseases, including malaria, meningitis, and cholera, cause massive disruption to societies and overburden national health systems.

In recognition of the need for improved understanding of current and likely future climate change one important objective is the further development and integration of in situ ground measurement systems, remote sensing monitoring techniques and appropriate early warning system, as the increasing trend in epidemics and natural disasters coincides with advances in weather and climate prediction and improved understanding of the relationships between human health and the environment.

The plenary group discussed the following four topics:

a - Space supports for epidemic prevention
b - Epidemics warning and response based on space aid
c - Medical use of space technology in disaster
d - Bridge between medical field and space technology

Topic A: Space supports for epidemic prevention

Objectives

- Analyze the geographic information required to monitor the risks of epidemic outbreaks and create prediction models
- Assess latest satellite communications tools for data transmission with field-level epidemic surveillance teams in remote areas
- Explore ways in integrating space-based technologies with epidemic control systems to prevent the outbreak of diseases after natural disasters

Recommendations and Perspectives

Epidemic outbreak is one of the most fatal catastrophes, especially in developing or least developed countries. Moreover, ecological and environmental changes caused by natural disasters can lead to epidemic outbreaks. For example, malaria outbreaks in the wake of flooding are a well-known phenomenon in malaria-endemic areas. Most of post-disaster infection is spawned by poor sanitation, a lack of safe drinking water and contaminated food. Nowadays, GIS technology is used to improve risk mapping and make prediction models of epidemic diseases such as SARS, Avian influenza, malaria, and ocean-borne cholera. Satellite technology also provides communication tools with regional epidemic surveillance teams to gather field information in remote high-risk areas. However, the approaches are still fragmented due to the complexity of the problem and the knowledge gap between medical experts and space experts. UN-SPIDER should provide a gateway for acquiring information on space-based technologies for epidemic risk analysis for health workers. The broad spectrum of needs is typically generated by the end users in the epidemic surveillance field. An integrated discussion with space experts and health workers will lead to answers to increase the potential of efficient epidemic prevention systems based on space-based technologies.

Topic B: Epidemics warning and response based on space aid

Objectives

- Explore new methods in utilizing earth observation systems for early warning and response to epidemic crises
- Define the role of satellite communications technology for immediate warning and response to epidemic outbreaks such as SARS and pandemic flu
- Clarify the mapping and communications tools needed to deal with secondary disease outbreaks after natural disasters
- Define the highest-priority data categories and providers which should be accessed in the case of an outbreak

Recommendations and Perspectives

New epidemic threats such as SARS, pandemic flu and bioterrorism pose challenges for countries and communities globally. These epidemic diseases can spread faster and further, aided by high-speed travel, increased trading of goods between countries, and social and environmental changes. In today's globalized world, an outbreak or an emerging infectious agent anywhere on earth must now be considered a threat to all. Therefore the immediate response and early warning in the risk area is key to limiting the spread of disease. GIS data from satellites can help workers clarify the contaminated region and separate it immediately. Early warning systems using satellite communication, GIS and GPS technology provide a fast and resilient way to distribute over geographical areas alarms and information to the population to facilitate adequate protective measures for the safeguard of citizens’ health in catastrophic events such as the tsunamis. No single institution or country has all the capacities to respond to international public health emergencies. In order to provide the most urgently required information for fast response, a focused discussion must be organized where different actors bring in different perspectives.

Topic C: Medical use of space technology in disaster

Objectives

- Explore practical ways in developing the potential of space-based communication technologies for medical treatment of disaster situation
- Analyze the user needs in utilizing mapping and navigation systems to estimate critical medical resource availability in disaster situations
- Explore solutions for overcoming drawbacks of using space technology for disaster medicine, such as satellite system costs, technical limitations and lack of knowledge

Recommendations and Perspectives

Health care is a critical part in all aspects of the disaster management cycle. Individual patients and medical resource assessments at a disaster situation can be coupled with GIS to support decision-making. When a disaster occurs, communications infrastructure on the ground can be destroyed. In this situation, satellite communications can be an answer to requirements of emergency healthcare services, and also support telemedicine equipment, telemanagement, teleconsulation, and telediagnosis. However, since actors in the medical field may be less familiar with space technology, there are still many

obstacles to overcome in utilizing space-based technologies in disaster medicine. To solve this problem, UN-SPIDER should provide gateway and guideline for the easy access to space-based information for disaster medicine. Before establishing the gateway system through UN-SPIDER, a discussion focused on analyzing the disaster medicine user needs is a necessary process.

Topic D: Bridge between medical field and space technology

Objectives

- Enhance knowledge sharing and collaboration between the space, disaster, and medical communities
- Assess the UN-SPIDER platform as a practical communication system for the medical field
- Increase the capacity of the medical field with regards to space-based technologies for disaster management to promote efficient cooperation

Recommendations and Perspectives

The collaboration between the space and medical fields can generate significant advances in disaster management. To realize this purpose, UN-SPIDER should provide a platform to bring together all related fields including medical experts, governments, NGOs, and private companies. This platform will offer easily accessible knowledge, useful information exchange, and practical communication. Through the active discussion between the respective experts, the way to realize the purpose can be clarified.

V. FINAL REMARKS:

Besides the very focused and instructive plenary presentations, participants also discussed key elements of UN-SPIDER in three working groups during session two. The recommendations of each group as well as from the other thematic sessions are listed in the corresponding sections of this document and the final remarks of the UN-SPIDER Bonn workshop will therefore be kept general and provide an outlook for the year 2009.

The discussions held during the workshop are part of an ongoing exercise that will also accompany the work of UN-SPIDER in 2009. During the course of the workshop participants managed to develop a sense of ownership of the programme and the wish to continue contributing to its success could be sensed strongly. With regard to the further development of the UN-SPIDER Knowledge Portal a core group of 64 members from 29 countries was successfully established with the intention of advising and supporting the UN-SPIDER team on the following three aspects:

- Architecture functions
- Content compilation

- Communication platform

The very nature of UN-SPIDER as a coordinating entity and the way it is set up depends on a broad support from both the space and disaster management communities. It will therefore be one of the core tasks of the programme staff to create an understanding that UN-SPIDER belongs to the people, initiatives and organisations that contribute to and use the programme.

The outcome of the second Bonn Workshop gave valuable orientation and guidance on the further implementation of UN-SPIDER, in terms of coordinative and cooperative activities, as well as the further development of technical issues of the Knowledge Portal.

Every UN-SPIDER activity that was discussed during the Bonn workshop will start being implemented during the year 2009. The recommendations made in the working groups will be taken into account and participants will be able to see their ideas reflected in the work of the programme. In 2009 up to 4 international and regional workshops or expert meetings are being planned and one of them is being proposed to be held in Bonn to take stock and to further guide UN-SPIDER on its way of ensuring that the merits of the whole range of space-based solutions for the whole disaster management cycle are not only being recognised but also fully integrated into national policies and programmes.

Workshop Programme

Monday, 13 October 2008

Opening Session: Disaster Management and Space Technology - Bridging the Gap

Chairman: Joerg Szarzynski, UN-SPIDER Bonn Office

1.) David STEVENS
Programme Coordinator - United Nations Office for Outer Space Affairs (UNOOSA)
"United Nations Platform for Space-based Information for Disaster Management and Emergency Response – UN-SPIDER"

2.) Gregoire DE KALBERMATTEN

Deputy Executive Secretary – United Nations Convention to Combat Desertification (UNCCD), Bonn, Germany
Welcome note on behalf of the UN in Bonn

3.) Heitor MATALLO Junior

Programme Officer – United Nations Convention to Combat Desertification (UNCCD), Bonn, Germany
"Desertification, land degradation, and drought. Global change equals disaster."

4.) Jan SOPAHELUWAKAN

Chairman Intergovernmental Coordination Group for the Indian Ocean Tsunami Warning and Mitigation System IOC-UNESCO, Jakarta, Indonesia
"Rapid- and slow-onset disaster management strategies and space based information: special reference to tsunami warning and mitigation system"

5.) Joerg SZARZYNSKI
Senior Expert - UN-SPIDER Bonn Office
"Outline of the workshop and organisational matters"

Session I: Space technology in support of risk and disaster management

Chairman: Robert BACKHAUS, UN-SPIDER Bonn Office

1.) Stefan VOIGT

German Aerospace Center, Environment and Security Unit, Center for Satellite Based Crisis Information, Oberpfaffenhofen, Germany
"Space in Support of Disaster Management - where do we stand?"

2.) Guido VAN DEN LANGENHOVE

Department of Water Affairs, Windhoek, Namibia

"Experiences with space technology in management of 2008 flood adversity in dry river delta in central northern Namibia."

3.) Daniel MANDL & Frederick POLICELLI

NASA, Goddard Space Flight Center, Greenbelt, Md., USA

"Sensor webs for disaster Management."

4.) Sreeja S. NAIR

Ministry of Home Affairs, Govt of India, National Institute of Disaster Management, New Delhi, India

"Disaster Management and Space Technology: Capacity Building Initiatives and Gaps."

5.) Veronica GRASSO

GEO Secretariat, Geneva, Switzerland

"GEO Disaster Management Clearinghouse"

6.) Tony LYU

Associate Expert - UN-SPIDER Bonn Office

"Development of the The UN-SPIDER Knowledge Portal"

Tuesday, 14 October 2008

Session II: Vulnerability and Risk Assessment

Chairmen: Juan Carlos VILLAGRAN DE LEON & Joern BIRKMANN, United Nations University – Institute for Environment and Human Security (UNU-EHS)

1.) Introduction: Juan Carlos VILLAGRAN DE LEON & Joern BIRKMANN

"Vulnerability and Risk Assessment"

2.) Francisco DELGADO

Cathalac, Ciudad del Saber, Panama

"SERVIR: Mesoamerican Regional Monitoring and Visualization System."

3.) Joachim POST

German Aerospace Center (DLR), German Remote Sensing Data Center (DFD) Oberpfaffenhofen, Germany

"Tsunami risk assessment for coastal areas in Indonesia"

4.) Stefan KIENBERGER

University of Salzburg, Center of Geoinformatics

"Community-based vulnerability assessment - the case of flood risk reduction in Central Mozambique"

Session III: Contribution of space-based technologies to existing and proposed early warning systems

Chairman: Douglas PATTIE, International Strategy for Disaster Reduction - Platform for the Promotion of Early Warning (UNISDR/PPEW)

1.) Introduction: Douglas PATTIE, UNISDR/PPEW

"Contribution of space-based technologies to existing and proposed early warning systems"

2.) Nicolas HEYER

RapidEye AG, Brandenburg, Germany

"RapidEye's Capabilities to Support Emergency Response and Disaster Management"

3.) Gerard ARMSTRONG & Trevor BARKER

Avanti Communications, London,UK

"Development of CTSP – Common Telecoms Service Platform (TANGO, CHORIST, SAT ALARM)"

4.) Natasha UDU-GAMA

LIRNEasia, Colombo, Sri Lanka

"Last Mile Hazard Information Dissemination"

5.) Li SUJU

National Disaster Reduction Center China (NDRCC)

"Disaster Management and Space Technology – Applications from China"

6.) Franz JASKOLLA

Infoterra GmbH, Friedrichshafen, Germany

"Kopernikus - Integrated Flood Risk Management Service and TerraSAR-X as new opportunity for emergency response"

7.) Ulrich LOOSER

Global Runoff Data Centre (GRDC), Koblenz, Germany

"The Global Runoff Data Centre (GRDC): Facilitator between Data Providers and Data Users."

8.) Emanuele GENNAI

ESRI Global, Geneva, Switzerland

"GIS Platforms: The Power of Interoperability"

9.) Natalia KUSSUL

Space Research Institute of the National Academy of Science of Ukraine and National Space Institute of Ukraine (NASU – NSAU)

"Data Integration for Natural Disaster Monitoring"

Wednesday, 15 October 2008

Session IV: Disaster Medicine, Telemedicine and Integrated Vector Management (IVM)

Chairman: David ROGERS – Health and Climate Foundation

1.) Introduction: David ROGERS, Marchissy, Switzerland
"Strenghthening Health Information Systems"

2.) Bernd SCHNEIDER
Institute for Disaster Medicine, Tuebingen, Germany
"What space-based information does the Disaster medical Community need in the acute phase of a disaster situation. Examples from Peru 2007, Myanmar and Sichuan 2008."

3.) Thomas WEBER
Institute of Aerospace Medicine, Cologne, Germany
"Telemedicine in the German Armed Forces - network of experts for disaster medicine."

4.) Georgi GRASCHEW
Surgical Research Unit OP 2000, Robert-Roessle-Klinik and Max-Delbrueck-Center, Charité – University, Berlin, Germany
"Globalisation of Health Care by Virtualisation of Hospitals."

5.) David HARGITT & Antonio ZUGALDIA
Centre for Research on the Epidemiology of Disasters (CRED), Brussels, Belgium
"Natural Disasters and Complex Emergencies: Geo-Referencing their Human Impacts"